

ANALYZING SOCIAL MEDIA APPROACHES IN MILITARY CAMPAIGNS: A SCIENTOMETRIC AND SCOPING PERSPECTIVE

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ABSTRACT

Social media has become a critical tool in modern military operations, playing a vital role in information dissemination, recruitment, and psychological warfare. This study employs a dual methodology of scientometric analysis and scoping review to evaluate the evolving use of social media in military campaigns. Scientometric analysis reveals an exponential growth in research publications on the topic from 2012 to 2024, indicating increased academic interest. Key themes identified include information warfare, public sentiment analysis, and misinformation management. Platforms like Twitter and Facebook have been instrumental in shaping public perceptions during conflicts, particularly in geopolitical hotspots like the Russo-Ukrainian war. The scoping review highlights how social media strategies have shifted from simple propaganda dissemination to sophisticated engagement tools for real-time coordination during crises. Military organizations are increasingly using these platforms for both psychological operations and recruitment. Despite these advantages, challenges such as disinformation, extremist content, and the need for digital literacy persist. By synthesizing trends and patterns from the literature, this study underscores the dual nature of social media as both a tool for empowerment and a vector for threats, thus emphasizing the need for strategic adaptations to mitigate risks and maximize impact in military settings.



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1. INTRODUCTION

Social media has become a vital element of modern military operations, significantly impacting areas such as information dissemination and psychological warfare. During the Russo-Ukrainian War, social media platforms have played a key role in the spread of user-generated content, transforming traditional photojournalism practices. This shift from "gatekeeping" to "gate watching" has raised concerns about the potential for propaganda and

highlighted the need for digital literacy to effectively evaluate various information sources (Fernández-Castrillo & Ramos 2023). Additionally, the rapid spread of information on social media necessitates prompt detection of rumors that could lead to societal panic and demoralization. Advanced models, like Reciprocal Perspective fused Graph Convolutional Neural Networks (RPF-GCNs), are being developed to improve rumor detection by analyzing the flow of information from both bottom-up and top-down perspectives (Khan et al., 2024).

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Furthermore, social media has emerged as a transformative force in contemporary warfare, evolving from a fundamental instrument for recruitment and propaganda to a sophisticated platform for information operations and public sentiment analysis (Ng & Cruickshank, 2023; Weinberg & Dawson, 2021). Initially, military organizations primarily utilized social media for recruitment and the dissemination of propaganda, capitalizing on its extensive reach to influence public opinion. For example, during the 2022 invasion of Ukraine, Russia employed platforms such as Twitter to propagate narratives related to fascism, thereby manipulating public perception and disseminating disinformation (Alieva et al., 2024). Sentiment analysis, exemplified in the context of the Israel-Palestine conflict, categorizes public opinion, thereby demonstrating social media's capacity to shape emotional landscapes during conflicts (Liyih et al., 2024). The evolution of social media as a tool in warfare is further illustrated by frameworks such as RPF-GCN, which addresses misinformation by enhancing rumor detection capabilities (Khan et al., 2024).

In addition to information warfare, social media is a potent tool for psychological operations (PsyOps), particularly employed by terrorist organizations like ISIS. These groups use social platforms to disseminate propaganda, recruit members, and spread misinformation, exploiting psychological vulnerabilities. For instance, ISIS recruits by crafting narratives that resonate with potential recruits' beliefs, capitalizing on the moral leniency towards belief-consistent disinformation (Joyner et al., 2023). Social media's ability to influence public perception during conflicts, such as the portrayal of the siege of Mariupol on Twitter, demonstrates its power to sway global sentiment (Tschirky & Makhortykh, 2024). Additionally, strategies like psychological inoculation can mitigate the spread of misinformation, although effectiveness varies (McPhedran et al., 2023).

While social media offers substantial advantages in warfare, it also poses significant challenges. It facilitates real-time information sharing and citizen engagement during conflicts, as seen in the Russian-Ukrainian conflict, where platforms like Telegram and YouTube coordinated humanitarian aid (Herus, 2023). However, its anonymity and reach make it fertile ground for disinformation and propaganda, as shown in efforts to disrupt societies and influence opinions against NATO (Bojor & Cîrdei, 2022). Furthermore, extremist groups use social media to propagate radical ideologies and instruct violent activities (Putra, 2022). This dual nature of social media—functioning as both an empowerment tool and a vector for threats—demands balanced strategies, including critical thinking and information verification (Herus, 2023; Putra, 2022). Consequently, social media's role in modern warfare requires strategic adaptation to mitigate risks and harness its potential. This study employs a scientometric and scoping approach to examine trends and patterns in social media research and their implications for effective impact in military settings.

The primary objective is to evaluate the impact of social media interventions within military contexts using a dual

methodological framework that includes scientometric analysis and a scoping review. This comprehensive analysis entails examining publication trends to track the progression of research in this area and assessing the effectiveness of various social media platforms. Ultimately, the study aims to provide a holistic overview of current practices regarding social media in military settings, thereby guiding future directions in this field.

2. METHOD AND ANALYSIS DESIGN

2.1 Scientometric Analysis

Scientometric analysis is a widely adopted approach for analyzing and comprehending large quantities of scientific data. This method allows for a more profound comprehension of the progression of a specific field (Donthu et al., 2021). The utilization of scientometric parameters for evaluating research quality is increasingly prevalent. Researchers employ scientometric analysis for diverse purposes, such as identifying emerging trends and evaluating journal performance (Struck et al., 2021). It is also utilized to examine patterns of collaboration, research components, and publication trends within a particular research domain (Abdullah, 2022). Furthermore, scientometric analysis can help unravel the intellectual structure of a specific area, as evidenced in published works (Simao et al., 2021). In this study, we employ scientometric analysis to investigate research publication patterns on Social Media within the military. Our objective is to identify countries actively publishing in this area and analyze the themes and subthemes conveyed through authors' keywords.

2.2 Scoping Analysis

The primary aim of conducting scoping reviews is to identify and document the different categories of evidence that exist (Munn et al., 2018). Hence, the objective of this study is to explore the essential elements related to risk assessment in military context publications, with the purpose of consolidating the existing literature in this particular research domain. The objective of this scoping review was to identify knowledge gaps and highlight areas that require further investigation. To achieve this, we utilized the five-step scoping review framework put forward by Arksey and O'Malley (2005):

- 1) Establishing the research question.
- 2) Identifying relevant studies.
- 3) Selecting studies.
- 4) Data charting.
- 5) Reporting results.

2.3 Establishing Research Question

The following research question serves as the basis for scoping analysis in this study:

- 1) Based on the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research Type) tool (Cooke et al., 2012), What are the most crucial findings from previous studies regarding Social Media in military environments?

2.4 Identifying Relevant Studies

2.4.1 Database

To access scientific publications in journals, repositories, archives, and other collections, it is essential to use databases and search engines (Abdullah et al., 2020). For this study, the Scopus and WoS databases were chosen to analyze scientometric and scoping indicators. These databases were selected because they prioritize the impact of document citations compared to other databases (Vieira & Gomes, 2009). Moreover, adjustments were made to ensure the validity of the coverage analysis, including improvements in metadata accuracy, document category classification, and discipline assignment. Therefore, Scopus and WoS give priority to these factors (Stahlschmidt & Stephen, 2022).

2.4.2 Search Strategy

After identifying the keywords, a search is conducted using an encyclopedia to find synonyms. Table 1 presents the search criteria used to compile lists of publications from the Scopus and WoS databases.

Table 1. Search strategy for extracting data from the Web of Science and Scopus databases.

Database	Search Strategy	Records
Web of Science	Topic: ("Social media" OR "Social networks" OR "Social communication tools" OR "Social web" OR "Digital social platforms") AND ("Military")	799
Scopus	Article Title, Abstract, Keywords: ("Social media" OR "Social networks" OR "Social communication tools" OR "Social web" OR "Digital social platforms") AND ("Military")	1490

The search was performed in May 2024, covering titles, abstracts, and keywords in both databases. It should be noted that no constraints were applied to the retrieved data during this phase, including limitations on date, publication type, or language.

2.4.3 Software

ScientoPy and VOSviewer are extensively utilized tools in academic research. ScientoPy, an automated Python script, offers a comprehensive analysis of primary subjects, authors, countries, and associated documents by utilizing author-generated keywords (Ruiz-Rosero et al., 2017). This approach effectively minimizes potential biases that may arise from conducting separate investigations. However, it is essential to acknowledge the possibility of biases when examining studies that employ author name analysis, as the outcomes can be influenced by similarities in names (Ruiz-Rosero et al., 2017). VOSviewer, developed by Van Eck and Waltman (2010), is a software program specifically designed for co-occurrence analyses of keywords within the military context, with a particular emphasis on risk assessment. By employing mapping techniques, VOSviewer transforms CSV data into visual

elements such as diagrams and clusters (Abdullah, 2022). These mapping strategies hold great promise for researchers analyzing various data points, including authors' keywords (Abd Aziz et al., 2021; Abdullah & Othman, 2022).

2.5 Selecting Studies

2.5.1 Publications Merge and Removal of Duplicates

The data from both databases was compiled and processed using ScientoPy. During this stage, the data was standardized. This process includes substituting commas in the author's name with semicolons, eliminating dots, commas, and distinctive formatting from the author's name, and removing duplicate entries with identical titles and authors. Employing this approach enhances the accuracy and dependability of the datasets. The outcomes of the preprocessed data are presented in Figure 1.

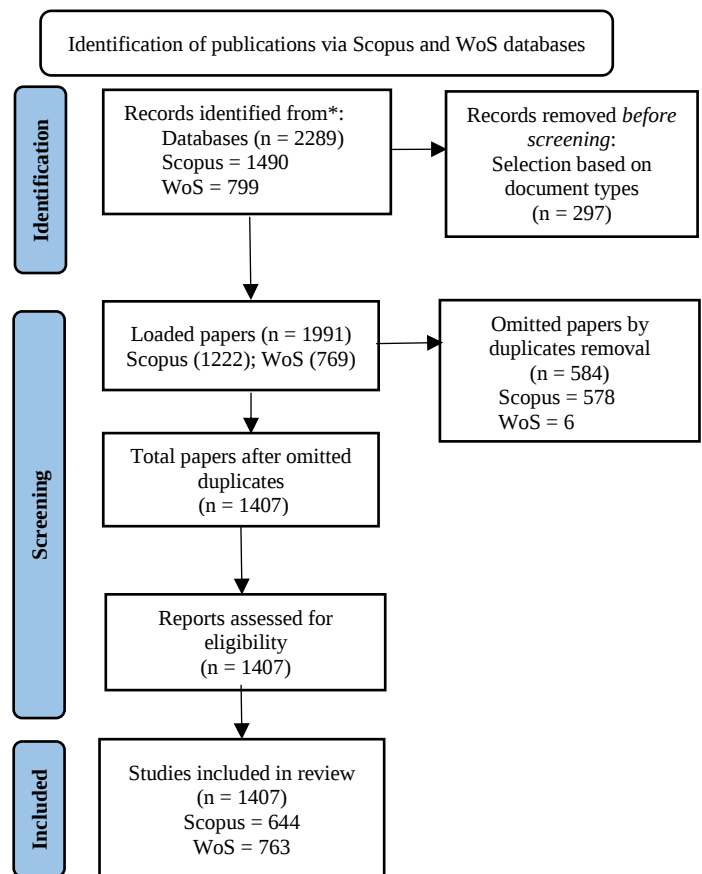


Figure 1. Flow diagram of research of databases and registers

Figure 1 presents a comparison between the number of documents obtained from the Web of Science (WoS) and Scopus databases, specifically focusing on the topic of social media within the military. It also highlights the percentage of duplicate documents that were eliminated. The results indicate that WoS has a high degree of uniqueness, as only 1% of the documents were identified as duplicates and removed. This suggests that the majority of documents in WoS are distinct and valuable for this research topic. On the other hand, Scopus exhibits a high

level of redundancy, with 47% of the documents being duplicates and subsequently removed (Figure 2). This finding suggests that almost half of the documents loaded from Scopus were repeated. Consequently, WoS appears to offer a more distinctive dataset compared to Scopus for studying this particular research area. Diagram 1 provides additional information by illustrating that the source dataset comprises 2289 papers sourced from both the WoS and Scopus databases. ScientoPy's automated categorization eliminated 584 documents, such as books, letters, and errata, and assigned the remaining publications to various categories, including conference papers, articles, reviews, proceedings papers, and press pieces.

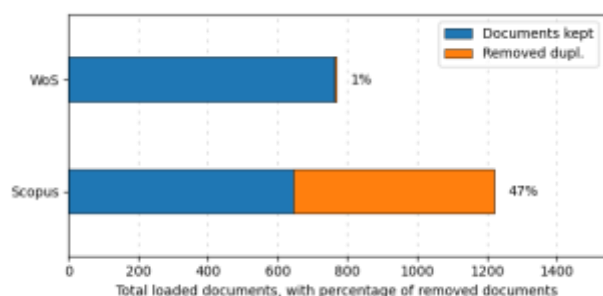


Figure 2. Data Combination and Duplicates Removal

Following the data reconciliation process, this study utilized a combined total of 1407 entries from both databases, consisting of 763 papers from WoS and 644 from Scopus. Furthermore, 578 duplicate entries from Scopus and 6 from WoS were subsequently eliminated.

2.5.2 Data Charting

The publication growth graph shows the evolution of publishing in the Scopus and WoS databases. This data is important for understanding the overall publication trend. In order to gain a more comprehensive understanding of the articles selected in the previous stage, we analyze the evolution graph of the top 10 authors' keywords and examine the co-occurrence of these keywords.

2.5.3 Reporting Results

In accordance with our study objectives, we have compiled a concise summary and report of our findings. We utilized ScientoPy as a tool to analyze the growth of publications, determine the countries actively engaged in research, and investigate keywords. To evaluate the co-occurrence of authors' keywords, we employed VOSviewer as a descriptive metric. It should be noted that a minimum of two keywords is necessary to generate co-occurrence results for authors' keywords using VOSviewer. Additionally, we took great care in reviewing and modifying the thesaurus files to avoid duplication of authors' keywords, following the recommendation by Abdullah et al. (2022).

The scoping review methodology aims to provide a comprehensive overview of existing research within a specific field. One of the primary objectives of conducting a scoping study is to identify any gaps or deficiencies in the current research literature. In this study, our aim was to thoroughly examine and describe the present state of

research on social media, as well as identify areas where the literature is lacking. To conduct this analysis, we utilized articles obtained from Scopus and WoS, which underwent preprocessing using ScientoPy. The specific inclusion criteria for this scoping review can be found in Table 2.

- 1) Written in English.
- 2) Publications from 2013 and later.
- 3) Describe primary research.
- 4) Use the keyword Twitter in the authors keywords.

3. RESULTS

3.1 Scientometric Outcome

3.1.1 Publication Growth

Figure 3 illustrates the increasing number of publications on social media within military contexts from 1992 to 2024, as indexed in the Web of Science (WoS) and Scopus databases. Initially, both databases show minimal activity until around 2008, when a slight increase begins. From 2012 onwards, a more pronounced upward trend is evident, reflecting growing academic interest and research in this field. The most significant rise occurs from 2020 to 2024, particularly in the WoS database, which shows a higher number of publications compared to Scopus. This trend indicates a surge in scholarly attention to the role of social media in military settings in recent years. This observation indicates a rapidly growing scholarly interest and research activity in the role and impact of social media within military contexts, particularly in the last decade. The significant increase in publications from 2020 to 2024 suggests that this topic has become increasingly relevant and critical, possibly driven by recent advancements in technology, changes in military communication strategies, and the evolving role of social media in information warfare and public perception. The higher number of publications in the WoS database compared to Scopus in recent years might also indicate that WoS is more comprehensive in indexing research in this emerging field. The growing number of publications that focus on social media in military contexts reflects an increasing academic interest in comprehending the intricate dynamics and trends of social media research within military settings. This trend underscores the significance of maintaining an ongoing dialogue between scholars, military subject matter experts (SMEs), and social media professionals to effectively navigate the complexities of investigating the impact of social media on military operations and public perceptions. Research has demonstrated that social media platforms play a pivotal role in shaping public perceptions of contemporary wars, such as the Russian invasion of Ukraine (Tschirky & Makhortykh 2024). Moreover, the analysis of social media content pertaining to military trauma highlights the necessity of employing multiple bibliometric measures to capture impactful research that often goes unnoticed by traditional citation counts (Kobilke et al., 2023). Additionally, an examination of how arms manufacturers utilize social media, specifically

Twitter, to depict women draws attention to the intersectional nature of these portrayals and their influence on public perceptions (Dilday et al., 2023).

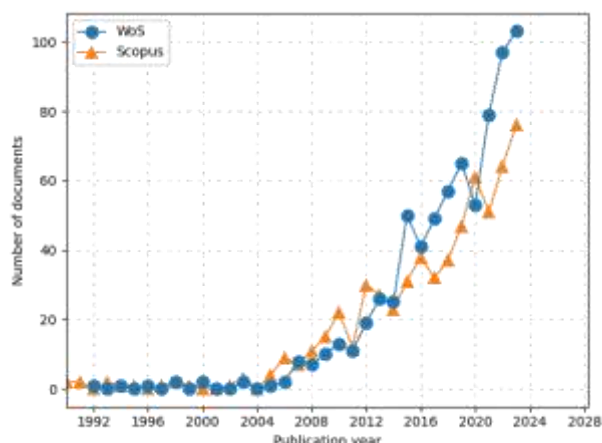


Figure 2: The evolution of publication growth (Source: Author, using ScientoPy 2.1.3).

3.1.2 The Most Influential Academic Works

Figure 3, titled "The Most Influential Academic Works on Social Media within Military," depicts the total number of influential documents published by different institutions and their impact over time. The chart categorizes the documents into two groups: those published "Before 2022" (represented by blue) and those published "Between 2022 - 2023" (represented by orange). It is important to note that Yale University and Bar Ilan University have a significant proportion of their influential works (50% and 33%, respectively) published in the recent period, indicating their ongoing relevance and impact. Conversely, the US Army and the University of Leeds have not produced influential documents recently, as their bars are entirely blue.

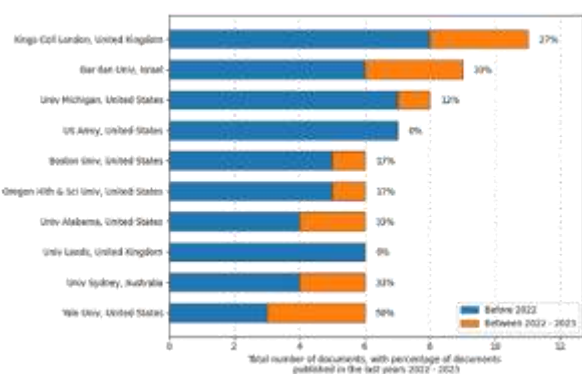


Figure 3. Institution Bar Trends Graph

Kings College London and the University of Alabama also demonstrate a notable trend of recent publishing, with 27% and 33% of their works, respectively, being from the 2022-2023 period. Figure 3 underscores the varying levels of recent academic influence among institutions in the military sector, highlighting both sustained and emerging contributions.

3.1.3 Authors' Keywords

Figure 4 displays significant findings concerning the prevalence and recent trends of influential keywords related to social media in the military domain. Notably, there has been a remarkable increase in the number of publications featuring the keywords "Ukraine" and "Russia," accounting for 59% and 50% of documents published between 2022 and 2023, respectively. This indicates a heightened attention on these regions, likely attributed to ongoing geopolitical conflicts and their impact on military strategies and social media discussions. Moreover, keywords such as "Twitter," "Veterans," and "Facebook" have also garnered considerable recent interest, with 32%, 34%, and 27% of documents published during the same period, respectively. This underscores their continued relevance in the examination of social media within military contexts. Conversely, terms like "Social Network" and "Social Network Analysis" have exhibited relatively slower growth, with only 9% and 17% of recent publications, respectively. This suggests a stable or declining interest in these areas. Overall, the chart underscores a dynamic shift in research focus towards contemporary issues and platforms, reflecting the evolving landscape of social media's role in military contexts.

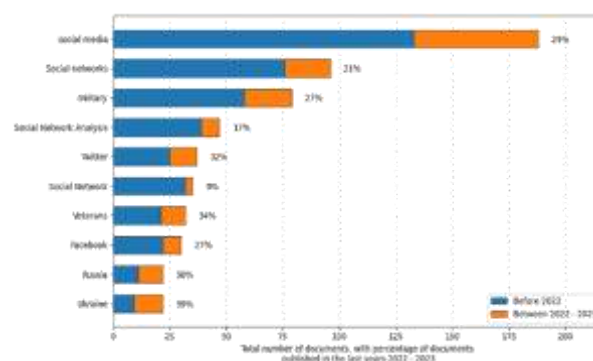


Figure 4: The bar-trend graph of research themes and topics emerging (Source: Author, using ScientoPy 2.1.3).

Figure 5 showcases a scientometric visualization generated using VOSviewer, a specialized tool for analyzing scientific literature. This visualization presents a co-occurrence network map that illustrates the relationships between various keywords utilized by authors within the realm of social media in the context of military studies. The size of the nodes corresponds to the frequency of each keyword, while the thickness of the connecting lines indicates the strength of their co-occurrence. Notably, central nodes such as "Social media," "military," and "Twitter" emerge, underscoring their significant and frequent roles in research. The map reveals distinct clusters: "Ukraine," "Russia," and "Facebook" are closely associated with terms like "disinformation," "propaganda," and "information warfare," pointing to a substantial focus on geopolitical conflicts and their impact on social media. Another cluster, centered around "veterans," "social support," and "PTSD," highlights the emphasis on mental health and community assistance within military contexts. Additionally, interconnected keywords such as "COVID-19," "resilience," and "gender" suggest recent research

trends that explore challenges related to the pandemic and gender issues within the military. The color spectrum, representing the temporal gradient from 2016 to 2021, demonstrates the evolving nature of these research topics over time. In summary, this map sheds light on key areas of focus and emerging trends within the intersection of social media and military studies, emphasizing the dynamic and multifaceted nature of this research field.

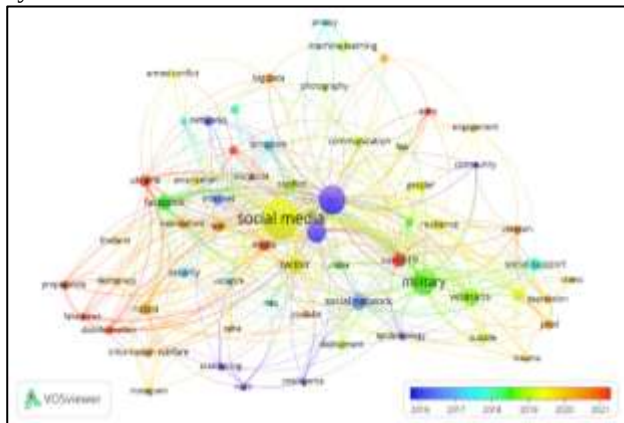


Figure 5. Co-occurrence of authors' keywords

No	Sources	Sample	Phenomenon of Interest	Design	Evaluation	Research Type
1.	Eagle & Okonkwo (2023)	The study compared the top 10 most cited articles on the association between contact sports/military service and chronic traumatic encephalopathy (CTE), finding that CTE+ articles had higher average citations, altmetric scores, and media reach compared to CTE- articles.	Examined the impact and media dissemination of articles supporting (CTE+) or refuting (CTE-) the link between contact sports/military service and CTE, highlighting disparities in citations, altmetric scores, news stories, and social media interactions	Employed a cross-sectional study design to analyze the impact of published scientific articles on the association between contact sports or military service and CTE	Scientific articles supporting the association between contact sports/military service and chronic traumatic encephalopathy CTE had significantly higher citations, altmetric scores, and media reach compared to articles refuting this link, indicating greater dissemination and public consumption of CTE+ research	A cross-sectional study design
2.	Dynel (2023)	Analyzed 500 randomly selected tweets marked with "FuckPutin" from an initial corpus of 37,782, demonstrating the hashtag's dual role in expressing both aggression and solidarity during the 2022 Russian invasion of Ukraine	Examines "hashtag swearing," focusing on the hashtag "FuckPutin" used during the 2022 Russian invasion of Ukraine to explore its dual role in expressing aggression and solidarity, fostering a sense of unity among users	Employed a multimodal discourse analysis design to investigate the phenomenon of "hashtag swearing" on social media platforms, focusing on tweets marked with "FuckPutin" in response to the 2022 Russian invasion of Ukraine	The "FuckPutin" hashtag combines aggression and solidarity, fostering unity among users and serving as a tool for political expression on Twitter in response to the 2022 Russian invasion of Ukraine	Qualitative
3.	Cruikshank & Xian Ng (2023)	User profiles interacting with U.S. Army recruitment tweets on Twitter, analyzing social identity signals and categorizing groups such as military-related profiles, sports enthusiasts, and various community groups	How social media, specifically Twitter, is used for recruitment by the U.S. Army and how different groups of people interact with these recruitment messages	Analyzing interactions with U.S. Army recruitment tweets on Twitter using network analysis, identity extraction, and bot detection to understand the social identities and communities formed around these interactions	The effectiveness of U.S. Army recruitment tweets on Twitter, finding that engagement primarily comes from already military-affiliated or inclined users and that the presence of bots may negatively impact recruitment efforts.	Descriptive study
4.	Massa & Anzera (2023)	Israel Defense Forces (IDF)' Twitter account to examine how it creates narratives, projects an image, and manages conflicts, normalizing militarism and reflecting social media trends in military communication	Examines how the IDF use Twitter to create narratives, project images, and manage conflicts, normalizing militarism and adapting military communication to social media norms and strategies	Employs qualitative content analysis of IDF' tweets to explore how they create narratives, project images, and manage conflicts, normalizing militarism and reflecting trends in military communication and social media logic	evaluates the IDF's effective use of Twitter to create narratives, project images, and manage conflicts, normalizing militarism and reflecting broader trends in military communication on social media	Qualitative
5.	Zarrabeitia-Bilbao et al. (2023)	Consists of 3,709,417 English tweets about nuclear energy, focused on user interactions and emotions around significant events like the Russian invasion of Ukraine and the attack on Zaporizhzhia NPP	The social listening analysis of nuclear energy using Twitter data mining to understand societal attitudes and sentiments during significant events like the Russian invasion of Ukraine and the attack on Zaporizhzhia NPP	Combines social network analysis with artificial neural network models to analyze Twitter data on nuclear energy, focusing on sentiment analysis before and after significant geopolitical events like the Russian invasion of Ukraine	Analyzing Twitter interactions and emotions about nuclear energy using social network analysis to identify key actors and communities, and sentiment analysis with deep learning algorithms during critical periods surrounding the Russian invasion of Ukraine and the attack on Zaporizhzhia NPP	Quantitative

3.2 Scoping Outcomes

This section provides a comprehensive examination of the incorporation of social media in publications related to the military. This analysis serves as a crucial initial step in identifying areas of knowledge gaps and guiding future research endeavors. By doing so, it contributes to the existing body of knowledge and promotes the adoption of best practices. To conduct this scoping analysis, qualitative research questions were formulated, and the SPIDER tool was employed as the search strategy. Table 2 presents a concise summary of publications based on author keywords obtained from ScientoPy. Initially, the information in Table 2 was condensed from a total of 37 documents. It is important to note that this study specifically focuses on the scoping analysis of research articles, excluding the other 17 records that were not classified as research papers.

Table 2: List of Inclusive Publications

6.	Miller et al. (2022)	Analyzed April 2020 tweets to understand nursing profession representation during early COVID-19, using natural language processing, WAG Modeling, and thematic analysis to identify themes such as support for nurses, metaphors, advocacy, and political commentary	The representation of the nursing profession and nurses' experiences during the early COVID-19 pandemic on Twitter in April 2020, revealing discrepancies between public perceptions and the realities faced by nurses	Utilized a qualitative design to analyze April 2020 tweets about nursing during the early COVID-19 pandemic, employing natural language processing, WAG Modeling, and thematic analysis to identify six main themes representing nurses' experiences and public perceptions	Analyzed April 2020 tweets using natural language processing, WAG Modeling, and thematic analysis, identifying six themes about nurses' portrayal and experiences during early COVID-19, revealing positive public perceptions but highlighting the harsh realities faced by nurses	Qualitative
7.	DiResta et al. (2022)	Data from an unpublished Stanford Internet Observatory dataset, GRU Facebook post-level datasets, and CrowdTangle analytics, focusing on disinformation campaigns and social media interactions related to Syria, as well as reposts from Syrian and Iranian state media	The execution of disinformation campaigns by digital mercenaries, including private marketing firms, troll networks, and PR firms, to manipulate public opinion and shape global narratives, particularly regarding geopolitical events like the Syria crisis, and the role of social media platforms in detecting these operations	Analyzes social media datasets from Facebook and Twitter, using tools like CrowdTangle to study and attribute the coordination and impact of disinformation campaigns by actors like the GRU and IRA	The effectiveness of social media platforms in detecting and attributing disinformation campaigns, the role of digital mercenaries in spreading deceptive content, and measures the reach and engagement of such content using tools like CrowdTangle	Mixed method
8.	Hill et al. (2021)	Twitter accounts of 319 departments of surgery with Accreditation Council of Graduate Medical Education (ACGME) accredited general surgery residency programs, with data collected from Twitter and an anonymous survey distributed to these programs	The use of Twitter by surgery departments, focusing on account prevalence, activity, motivations for use, perceived benefits, and concerns related to social media engagement	A cross-sectional study, which involved collecting data from Twitter and conducting an anonymous survey to understand the patterns and motivations of Twitter use by surgery departments	Only a quarter of surgery departments had Twitter accounts, with key benefits being the promotion of new research and increased academic visibility, while concerns included professionalism, privacy, and time commitment	Qualitative
9.	Britt et al. (2021)	includes social media users who are part of the Twitter conversation about veteran suicide, specifically focusing on identifying those who can act as intermediaries to reach peripheral users	Identification of intermediaries who can bridge the gap between central and peripheral users in social media conversations about veteran suicide, aiming to improve information dissemination and support	Application of a new network measure called targeted betweenness centrality to identify key social media users who can act as opinion leaders and intermediaries in the Twitter conversation on veteran suicide	Targeted betweenness centrality is a practical and useful measure for identifying opinion leaders and intermediaries in social media networks, providing valuable insights for suicide prevention efforts among military veterans	Quantitative
10.	Dergacheva (2021)	Political communication on Twitter by the Government of Spain during the peak of the Covid-19 pandemic, focusing on the campaign #EsteVirusloParamosUnidos from March 31 to April 4, which were the dates with the worst outcomes in terms of fatalities	the political communication strategies employed by the Government of Spain on Twitter during the Covid-19 crisis, particularly focusing on the use of the hashtag #EsteVirusloParamosUnidos and the creation of homogeneous communities during this period	Utilized Social Network Analysis (SNA) techniques to analyze and visualize the network woven inside the hashtag #EsteVirusloParamosUnidos on Twitter during the Covid-19 pandemic. The study aimed to identify the main actors, study the interactions in the network, and determine the main users disseminating information in the ego networks of key actors	Identifying the main actors, studying interactions in the network, and determining the key users disseminating information within the ego networks of important actors in the Twitter campaign #EsteVirusloParamosUnidos during the peak of the Covid-19 crisis	Qualitative
11.	Molnar et al. (2021)	European Union's (EU) Common Security and Defence Policy (CSDP) missions' social media use, specifically four CSDP missions in the Mediterranean and Western Balkans regions	The strategic communication of the EU's CSDP missions, particularly through Twitter, to measure the EU's external legitimacy	Combining computer-assisted content analysis to extract data on Twitter communication of selected missions, followed by a quantitative analysis to identify elements of the EU's strategic communication	Patterns of communication did not align with regional or civilian-military divisions, with a strong emphasis on connectivity with other European actors and institutions. The study found that local ownership was observed only at the European level, with limited targeting of local populations in host countries	Mixed Methods
12.	Sumner et al. (2020)	Twitter users who have communicated about suicide, as the study focuses on analyzing suicide-related communication on the social media platform Twitter	The communication patterns and connectivity of suicidal users on Twitter, aiming to understand how these users interact and express their thoughts on the platform	A machine classification and analysis approach, which involves using algorithms to classify and analyze the content of tweets related to suicide	Machine learning techniques can effectively classify and analyze suicide-related communication on Twitter, providing insights into the behavior and connectivity of suicidal users on social media	Quantitative
13.	Safitri & Angeline (2020)	Representatives from the Public Relations Division of TNI AU (DISPENAU) and Twitter Indonesia, along with virtual observations of TNI AU's Twitter account and other Indonesian online mass media over five months	How the Indonesian Air Force (TNI AU) uses Twitter to enhance public engagement and communication, employing strategies like conversational tones, emoticons, and timely updates to improve their public image and interaction	A case study approach, focusing on the unique case of TNI AU's Twitter account to understand how it serves as a pioneer of interactive public communication in Indonesia	TNI AU's use of Twitter has successfully increased public engagement, improved the public perception of the military, and significantly boosted the rate of student intake for the Indonesian Military Air Force by 250% within a year	Qualitative
14.	Ben-David (2019)	118,508 unique web addresses (URIs) and relevant metadata,	Retrospective web archiving (RWA), which aims to fill	A case study approach, focusing on the 2014 War in	Four years after the 2014 War in Gaza, only 50 of the	Quantitative

		collected from platforms like Wikipedia, Google, Twitter, and YouTube, related to the 2014 War in Gaza	gaps in existing web archives and expand web archiving from the open web to cross-platform curation and international perspectives	Gaza, to test the proposed method for retrospective web archiving by collecting and analyzing web data from various platforms	collected URIs were still available on the live web, and just 38 had been archived elsewhere, highlighting the challenges in web archiving	
15.	Schneider et al. (2019)	Twitter accounts of 58 Private Military and Security Companies (PMSCs), which were analyzed to understand their social media strategies and how they present themselves online	How PMSCs use Twitter to promote their services, monitor public perception, and distract from their actual activities, given the sensitive nature of the security services they provide	Analyzing the content of Twitter posts from the selected PMSCs to draw conclusions about their social media strategies	PMSCs use Twitter similarly to other companies for promotion and monitoring but also uniquely to distract from their controversial activities, highlighting the varied functions of social media across different industries	Mixed Methods
16.	Essam et al. (2019)	Various studies and data sources related to cognitive linguistics, social psychology, and geopolitical issues, as indicated by the diverse references such as those on deceptive language, nationalism, and energy supply security	Revolves around understanding language use, cognitive processes, and social behaviors in different contexts, including deception in criminal suspects, nationalism in anthems, and public diplomacy	Involving text analysis, case studies, and thematic analysis to explore various linguistic and social phenomena	Highlights the importance of language and cognitive analysis in understanding social behaviors and geopolitical issues, providing insights into how language reflects and influences social dynamics and public perceptions	Mixed Methods
17.	Schneider et al. (2019)	- Utilized data collected from the Twitter feeds of private military and security companies (PMSCs). - Analyzed tweets from 58 Twitter accounts of selected PMSCs, focusing on companies headquartered in the United States or United Kingdom	How PMSCs utilize Twitter's features to promote their services and products, enhance their image, and analyze the resulting narratives created by both the companies and other users	Employed a mixed-methods design, combining quantitative methods like data mining and sentiment analysis with qualitative content analysis to analyze the Twitter behavior of PMSCs	Highlighted the benefits of using mixed methods for analyzing social media, showing how combining quantitative and qualitative approaches can effectively address the challenges of studying PMSCs' Twitter activity	Mixed-methods
18.	Joachim et al. (2018)	Twitter messages posted by two major United States-based private military and security companies (PMSCs) - CACI and DynCorp International	How PMSCs deploy different identities (business, military, humanitarian) to recruit new personnel through social media	Involved a computer-assisted content analysis of Twitter messages posted by CACI and DynCorp International to understand how these PMSCs construct and communicate their identities to attract personnel	PMSCs amplify their business and military identities to attract talented personnel, with CACI branding itself as sophisticated and patriotic, while DynCorp presents itself as a traditional military provider	Qualitative
19.	Hisam et al. (2017)	237 young adults aged 20-40 years from different universities in Rawalpindi, Pakistan, selected through non-probability convenient sampling	The association of psychological stress with political activism on social networking sites (SNS) among adults	Descriptive cross-sectional study conducted over eight months from August 2014 to March 2015	A significant association between occupation and both political activism and psychological stress, with 38.4% of participants experiencing stress and 61.6% not experiencing stress	Quantitative
20.	Oussalah et al. (2013)	Tweets collected from Twitter, which includes various data elements such as text, user information, and geo-location data, stored in an SQLite database for analysis	The analysis of tweets to understand social behavior, trends, and interactions, leveraging the geo-location and textual characteristics of the tweets to provide insights into online behavior and social trends	Involves creating a software system for automatic tweet collection and retrieval, using databases like MySQL and Cassandra, and employing APIs for data collection and analysis, focusing on both spatial and textual queries	Highlights the challenges in collecting, storing, and analyzing large volumes of tweets in real-time, emphasizing the need for efficient data processing systems and the limitations of current APIs in handling the vast amount of data generated on Twitter	Quantitative

4. DISCUSSION

Based on the analysis of keywords, it is evident that social media in the military context is most strongly associated with notational analysis, multivariate analysis, and kinetics. This finding underscores the crucial role of notational analysis in military communication strategies on social media platforms, such as Twitter. It is worth noting that military communication is adapting to the digital landscape by utilizing online platforms for both promotional and conflict-related purposes (Keddem et al., 2022). Moreover, a study examining the Russian disinformation campaign during the Ukrainian war highlights the employment of a multi-modal approach, including Image Plotting, to analyze propaganda messaging on various platforms. This demonstrates alignment with established Russian strategies and operations (Massa & Anzera, 2023). Additionally, an investigation into the proliferation of social bots on

Twitter during the Russia-Ukraine conflict underscores the influence of these bots on public opinion through the dissemination of biased content. This sheds light on the intricate dynamics of information warfare on social media platforms.

The topic of social networks in military contexts is highly intriguing and deserves further investigation. The intersection of social networks and the military is a captivating area of study, as evidenced by various research papers. These studies have revealed that the US and Australian Departments of Defence strategically utilize social media platforms for branding, perception management, and crisis communication during significant events such as troop withdrawals and evacuations (Uwalaka, 2023). Furthermore, research on the ongoing conflict in Ukraine highlights how English, Russian, and German-speaking Twitter communities shape perceptions of NATO's role, emphasizing the importance of cultural and linguistic sensitivity when

analyzing social media content during times of war (Kobilke et al., 2023). Moreover, investigations into arms manufacturers' Twitter feeds reveal how they leverage social media to present themselves as transparent and progressive, ultimately facilitating the arms trade through strategic communication strategies (Jester, 2023). Additionally, studies on post-conflict societies, such as the successor states of former Yugoslavia, demonstrate the lasting impact of wartime experiences on individuals' online social networks, emphasizing the enduring effects of wars on societies and reconciliation efforts (Lesschaeve & Glaurdić, 2023). Finally, research on the Israel Defense Forces' Twitter account showcases how military communication adapts to online platforms, employing social media logic to normalize militarism and effectively manage conflicts (Massa & Anzera, 2023).

Military engagement on social media poses a range of risks and challenges, as underscored in the aforementioned research papers. These risks notably encompass the stigmatization and suspicion experienced by veterans who suffer from post-traumatic stress disorder (PTSD) when seeking employment, as a consequence of their disclosures on social media platforms (Vartanova, 2023). Arms manufacturers are also known to exploit social media as a means to endorse militarization and divert attention away from the violence associated with their products, thereby facilitating the arms trade. Moreover, states can weaponize social media, leading to the emergence of social network warfare and posing threats to national security and stability (Pina, 2022). To counter these risks effectively, it is imperative to adopt various strategies, such as raising awareness and fostering comprehension of PTSD (Radzi et al., 2024), enhancing transparency in arms manufacturing practices, and developing defenses against social media manipulation in the context of warfare. Additionally, addressing these challenges in a comprehensive manner necessitates the promotion of responsible usage of social media, the implementation of ethical frameworks, and the establishment of appropriate regulations.

A scoping analysis reveals that a total of 20 studies have been published in Scopus and WoS indexed journals since 2013. These studies primarily focus on the utilization of social media data, specifically from Twitter. The data analyzed includes tweets, user interactions, and account activities. The topics investigated in these studies include political hashtags, military recruitment, public perceptions of the nursing profession, and disinformation campaigns. Notably, researchers have explored the potential of Twitter data in addressing issues such as sexual violence (Xue et al., 2023), communication dynamics during wartime conflicts (Uwalaka, 2023), and branding efforts by defense departments during critical events such as troop withdrawals (Kobilke et al., 2023). Additionally, Singh and Gresenz (2022) have emphasized the use of social media data, including Twitter, in firearms research due to its extensive coverage, continuous nature, and compatibility with conventional data sources. Furthermore, analyzing the

communication strategies of military organizations, such as the Spanish Armed Forces, on Twitter can provide valuable insights into the factors that influence engagement with their tweets, highlighting the importance of rational and emotional communication attributes in effective messaging (Hafiar et al., 2024; Pina, 2022). Overall, these studies highlight the significance of Twitter data in military research for understanding public perceptions, communication strategies, and engagement dynamics in different military contexts.

The objective of this investigation is to analyze the influence of social media on public perception, communication, and behavior in various contexts. These contexts include military recruitment, political activism, healthcare, disinformation campaigns, and geopolitical events. The main goal of this study is to develop a comprehensive understanding of the various roles and complexities associated with social media platforms. Social media plays a crucial role in shaping public perception, communication, and behavior in different domains, such as military recruitment, political activism, healthcare, disinformation campaigns, and geopolitical events. Previous research has demonstrated the impact of social media on individuals' perception of risk and adherence to social distancing measures during pandemics (Adiyoso & Wilopo, 2021; Kobilke et al., 2023), influencing discussions on responsibility in armed conflicts (Mahoney et al., 2022), raising ethical considerations in research projects related to migration (Angawi & Albugmi, 2022), and affecting individuals' intention to receive vaccines through comparative information and psychosocial factors during the COVID-19 pandemic (Herzog et al., 2022). These findings highlight the multifaceted nature of social media platforms and emphasize their significance in understanding and navigating the complexities of contemporary societal interactions and behaviors.

5. CONCLUSION

This study provided a comprehensive analysis of social media strategies in military campaigns by employing both scientometric and scoping methodologies. The scientometric analysis allowed for the evaluation of research publication trends, identifying key countries, institutions, and themes in social media usage within military contexts. A significant rise in research from 2020 to 2024 highlights the growing relevance of social media in warfare, particularly in information dissemination and public sentiment analysis. The co-occurrence of keywords such as "Russia," "Ukraine," and "disinformation" demonstrates the critical focus on social media's role in recent geopolitical conflicts, especially its function in shaping narratives and managing public perception.

The scoping analysis explored the practical application of social media in various military operations, emphasizing the dual nature of social media as both an empowerment

tool and a threat vector. For example, social media platforms like Twitter and YouTube have been used for real-time citizen engagement and coordination during crises. Conversely, these platforms also pose significant challenges, such as facilitating the spread of disinformation, propaganda, and extremist ideologies, which have had profound implications in conflicts like the Russian invasion of Ukraine. Tools like the Reciprocal Perspective fused Graph Convolutional Neural Networks (RPF-GCNs) were highlighted as essential in improving rumor detection and mitigating misinformation risks on social media.

In summary, this dual-method approach has shed light on both the growing academic interest in and the practical challenges associated with social media in military operations. The findings underscore the need for strategic adaptations to manage the complex information flows, public perception, and the ethical concerns surrounding the use of social media in warfare. This study serves as a guide for future research and military policy development in the evolving landscape of digital warfare.

Limitation of the Current Study

One of the primary limitations of this study is the lack of a comprehensive publication list. The analysis of scientometrics and scoping in this study relies solely on the Scopus and WoS databases. Nonetheless, future

researchers have the opportunity to augment the present findings by incorporating additional databases such as Google Scholar, PubMed, and ERIC.

Contribution to the Body of Knowledge and Practices

This article enhances our understanding of the changing role of social media in military campaigns by employing scientometric and scoping methods. It examines how platforms like Twitter and YouTube facilitate information dissemination, sentiment analysis, and psychological operations in conflicts, particularly during the Russian-Ukrainian war. Furthermore, it addresses the challenges of disinformation and extremist ideologies, indicating that the dual nature of social media necessitates strategic adaptation to maximize its benefits while minimizing risks. This research provides a basis for future studies on the influence of social media on military strategies and public perception.

Ethical considerations

Not applicable.

Conflict of Interest

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